## What is claimed is:

- 1. Carbon powder having a primary particle size of 100 nm or less and an X-ray crystallite plane spacing  $C_0$  of less than 0.680 nm.
- 2. The carbon powder as claimed in claim 1, which has a primary particle size of 100 nm or less and an X-ray crystallite plane spacing  $C_0$  of 0.6730 nm or less.
- 3. The carbon powder as claimed in claim 1 or 2, which is carbon black.
- 4. The carbon powder as claimed in any one of claims 1 to 3, which shows a volume resistivity of 0.1  $\Omega$ ·cm or less in the pressurized state under a pressure of 2 MPa.
- 5. The carbon powder as claimed in any one of claims 1 to 4, wherein boron content is in a range of 0.001 to 5 % by mass.
- 6. The carbon powder as claimed in claim 5, wherein boron content is in a range of 0.1 to 5 % by mass.
- 7. A method for producing the carbon powder as claimed in any one of claims 1 to 6, comprising adding boron carbide ( $B_4C$ ) to carbon black in an amount of 0.01 to 7% by mass in terms

of boron and heat-treating the mixture at 2,500°C or more in a non-oxidative atmosphere.

- 8. The method for producing the carbon powder as claimed in claim 7, comprising adding boron carbide ( $B_4C$ ) to carbon black in an amount of 0.5 to 7% by mass in terms of boron.
- 9. The method for producing the carbon powder as claimed in claim 7 or 8, wherein the carbon black is at least one kind selected from the group consisting of oil furnace black, acetylene black, thermal black, and channel black.
- 10. An electrically conducting carbon composite powder for supporting a catalyst, comprising carbon powder as claimed in any one of claims 1 to 6, having mixed therewith fibrous carbon.
- 11. The electrically conducting carbon composite powder for supporting a catalyst as claimed in claim 10, wherein the fibrous carbon is vapor grown carbon fiber.
- 12. The electrically conducting carbon composite powder for supporting a catalyst as claimed in claim 11, wherein from 1 to 7% by mass of vapor grown carbon fiber is mixed with carbon powder.

- 13. The electrically conducting carbon composite powder for supporting a catalyst as claimed in any one of claims 10 to 12, wherein the carbon powder is heat-treated at a temperature of 2,500°C or more.
- 14. The electrically conducting carbon composite powder for supporting a catalyst as claimed in any one of claims 11 to 13, wherein the vapor grown carbon fiber is graphitized at a temperature of 2,500°C or more and boron content in the fiber is in a range of 0.001 to 5 % by mass.
- 15. The electrically conducting carbon composite powder for supporting a catalyst as claimed in claim 14, wherein the boron content in the vapor grown carbon fiber is in a range of 0.1 to 5 % by mass.
- 16. A catalyst for polymer electrolyte fuel battery, primarily comprising platinum or a platinum alloy and the carbon powder as claimed in any one of claims 1 to 6 for supporting the catalyst.
- 17. A catalyst for polymer electrolyte fuel battery, primarily comprising platinum or a platinum alloy and the carbon composite powder as claimed in any one of claims 10 to 15 for supporting the catalyst.

- 18. A polymer electrolyte fuel battery cell using the catalyst as claimed in claim 16 or 17 for anode catalyst layer and/or cathode catalyst layer.
- 19. A solid polymer electrode fuel battery comprising at least more than two of the stacked polymer electrolyte fuel battery cell as claimed in claim 18.
- 20. A polymer electrolyte fuel battery using the catalyst as claimed in claim 16 or 17 for anode and/or cathode electrode.